

IN THE CLAIMS

1-5. (Canceled)

6. (Previously Presented) A computer implemented method comprising:
maintaining a first set of information for a first layer 3 virtual private network (VPN), the first set of information for including a first value identifying the first layer 3 VPN;
separately maintaining a second set of information for a second layer 3 VPN, the second set of information for including a second value identifying the second layer 3 VPN, wherein the first and second sets of information corresponds to a first and second customers accessing a backbone and maintained within a single network element of the backbone, and wherein the first and second sets of information include sufficient information to establish the first and second layer 3 VPNs with other network elements of the backbone for the first and second customer respectively;
associating the first value with a first route distinguisher;
associating the second value with a second route distinguisher;
maintaining on a single network element a single exterior gateway protocol (EGP) table for the first and second layer 3 VPNs, wherein the single EGP table comprises EGP forwarding entries for the first and second layer 3 VPNs;
maintaining on the single network element a VPN-specific first routing table for the first layer 3 VPN, wherein the first routing table comprises interior gateway protocol (IGP) forwarding entries for the first layer 3 VPN; and
maintaining on the single network element a VPN-specific second routing table for the second layer 3 VPN, wherein the second routing table comprises IGP forwarding entries for the second layer 3 VPN.

7. (Original) The computer implemented method of claim 6 further comprising:

separately maintaining a third set of information for a non-VPN customer, the third set of information for including a third value identifying the non-VPN customer; and
maintaining a second EGP table for the non-VPN customer.

8. (Previously Presented) The computer implemented method of claim 6 further comprising:

updating a set entries for the first layer 3 VPN in the single EGP table, each of the set of entries indicating the first route distinguisher;
mapping the first route distinguisher to the first value; and
indicating the mapped first value in communication about the updated set of entries.

9. (Original) The computer implemented method of claim 6 further comprising:
maintaining a data structure for the single EGP table, the data structure indicating the association between first value and the first route distinguisher and between the second value and the second route distinguisher; and
performing mappings between the first value and the first route distinguisher and between the second value and the second route distinguisher with the data structure.

10-22. (Canceled)

23. (Previously Presented) A machine-readable storage medium that stores instructions, which when executed by a set of one or more processors, cause said set of processors to perform operations comprising:

maintaining a set of information for a first layer 3 virtual private network (VPN), the first set of information for including a first value identifying the first layer 3 VPN;
separately maintaining a second set of information for a second layer 3 VPN, the second set of information for including a second value identifying the second layer 3 VPN, wherein the first and second sets of information

corresponds to a first and second customers accessing a backbone and maintained within a single network element of the backbone, and wherein the first and second sets of information include sufficient information to establish the first and second layer 3 VPNs with other network elements of the backbone for the first and second customer respectively;

associating the first value with a route distinguisher (RD);

associating the second value with a second RD;

maintaining a data structure to perform mappings between the first value and the first RD and between the second value and the second RD;

maintaining on a single network element a single exterior gateway protocol (EGP) table for the first and second layer 3 VPNs, wherein the single EGP table comprises EGP forwarding entries for the first and second layer 3 VPNs;

maintaining on the single network element a VPN-specific first routing table for the first layer 3 VPN, wherein the first routing table comprises interior gateway protocol (IGP) forwarding entries for the first layer 3 VPN; and

maintaining on the single network element a VPN-specific second routing table for the second layer 3 VPN, wherein the second routing table comprises IGP forwarding entries for the second layer 3 VPN.

24. (Previously Presented) The machine-readable storage medium of claim 23 further comprising:
- separately maintaining a third set of information for a non-VPN customer, the third set of information for including a third value identifying the non-VPN customer; and
- maintaining a second EGP table for the non-VPN customer.
25. (Previously Presented) The machine-readable storage medium of claim 23 wherein the mappings are performed for communications about the single EGP table.
- 26-29. (Canceled)

30. (Previously Presented) A machine-readable storage medium that stores instructions, which when executed by a set of one or more processors, cause said set of processors to perform operations comprising:

- maintaining a first set of information for a first layer 3 virtual private network (VPN), the set of information for including a first value identifying the first layer 3 VPN;

- separately maintaining a second set of information for a second layer 3 VPN, the second set of information including a second value identifying the second layer 3 VPN, wherein the first and second sets of information corresponds to a first and second customers accessing a backbone and maintained within a single network element of the backbone, and wherein the first and second sets of information include sufficient information to establish the first and second layer 3 VPNs with other network elements of the backbone for the first and second customer respectively;

- associating the first value with a first route distinguisher;

- associating the second value with a second route distinguisher;

- maintaining on a single network element a single exterior gateway protocol (EGP) table for the first and second layer 3 VPNs, wherein the single EGP table comprises EGP forwarding entries for the first and second layer 3 VPNs;

- maintaining on the single network element a VPN-specific first routing table for the first layer 3 VPN, wherein the first routing table comprises interior gateway protocol (IGP) forwarding entries for the first layer 3 VPN; and

- maintaining on the single network element a VPN-specific second routing table for the second layer 3 VPN, wherein the second routing table comprises IGP forwarding entries for the second layer 3 VPN.

31. (Previously Presented) The machine-readable storage medium of claim 30 further comprising:

- separately maintaining a third set of information for a non-VPN customer, the third set of information including a third value identifying the non-VPN customer; and

maintaining a second EGP table for the non-VPN customer.

32. (Previously Presented) The machine-readable storage medium of claim 30 further comprising:

- updating a set entries for the first layer 3 VPN in the single EGP table, each of the set of entries indicating the first route distinguisher;
- mapping the first route distinguisher to the first value; and
- indicating the mapped first value in communication about the updated set of entries.

33. (Previously Presented) The machine-readable storage medium of claim 30 further comprising:

- maintaining a data structure for the single EGP table, the data structure indicating the association between first value and the first route distinguisher and between the second value and the second route distinguisher; and
- performing mappings between the first value and the first route distinguisher and between the second value and the second route distinguisher with the data structure.